

IN THE CLAIMS:

Claim 1. (currently amended) A micro-array system for a micro amount of biomolecules carrying on a bioreaction in a reaction solution, which comprises:

a substrate comprising a plurality of micro-wells for receiving the reaction solution;

a plurality of magnetic micro-beads ~~plac~~placed in the reaction solution for with the biomolecules attached on surfaces of the micro-beads thereof; and

~~a vibrating module for vibrating~~ vibration means for causing rapid back and forth movement of the substrate, ~~which makes to cause~~ the biomolecules attached on the micro-beads to react evenly; and

magnetic force means for removing the magnetic micro-beads from the reaction solution.

Claim 2. (original) The micro-array system according to Claim 1, wherein the biomolecules are selected from the group consisting of nucleic acids, peptides and carbohydrates.

Claim 3. (original) The micro-array system according to Claim 1, wherein the bioreaction is selected from the group consisting of polymerase chain reaction,

nucleic acid-nucleic acid hybridization, protein-protein hybridization, and nucleic acid-protein hybridization.

Claim 4. (original) The micro-array system according to Claim 1, wherein the substrate is made from silicon.

Claim 5. (cancelled)

Claim 6. (original) The micro-array system according to Claim 1, wherein the micro-beads are activated with a coupling agent for the biomolecules immobilized thereon.

Claim 7. (original) The micro-array system according to Claim 6, wherein the coupling agent is 1-ethyl-3-(3-dimethylaminopropyl)-carbodiimide hydrochloride.

Claim 8. (currently amended) The micro-array system according to Claim 1, wherein the vibration means comprise a vibrating module that is set under the substrate.

Claim 9. (currently amended) The micro-array system according to Claim 8 4, wherein the vibrating module comprises an electro-static vibrator.

Claim 10. (original) The micro-array system according to Claim 1 further comprising a temperature control module for controlling the temperature of the reaction solution.

Claim 11. (original) The micro-array system according to Claim 10, wherein the temperature control module comprises a temperature sensor, a heater, and a cooler.

Claim 12. (original) The micro-array system according to Claim 11, wherein the temperature sensor and the heater are a heating/sensing resistor.

Claim 13. (original) The micro-array system according to Claim 1 further comprising a laser source.

Claim 14. (original) The micro-array system according to Claim 13 further comprising a lens.

Claim 15. (original) The micro-array system according to Claim 1 further comprising a cover plate.

Claim 16. (original) The micro-array system according to Claim 1 further comprising a signal sensor.

Claim 17. (currently amended/withdrawn) A method for a micro amount of biomolecules carrying on a bioreaction in a reaction solution, which comprises:

(a) providing the micro-assay system according to claim 1; a plurality of ~~micro-beads~~;

~~— (b) attaching the biomolecules onto the micro-beads;~~

~~— (c) placing the micro-beads with the biomolecules attached thereon in~~

~~the reaction solution; and~~

~~—— (d) (b) carrying on the bioreaction by placing the reaction solution into the a plurality of micro-wells of the a substrate, wherein the substrate is vibrated by a vibrating module and causing the vibration means to vibrate the substrate to make the biomolecules attached on the micro-beads react evenly; and~~

~~(c) removing the magnetic micro-beads from the reaction solution with the magnetic force means.~~

Claim 18. (withdrawn) The method according to Claim 17, wherein the biomolecules are selected from the group consisting of nucleic acids, peptides and carbohydrates.

Claim 19. (withdrawn) The method according to Claim 17, wherein the bioreaction is selected from the group consisting of polymerase chain reaction, nucleic acid-nucleic acid hybridization, protein-protein hybridization, and nucleic acid-protein hybridization.

Claim 20. (withdrawn) The method according to Claim 17, wherein the substrate is made from silicon.

Claim 21. (cancelled)

Claim 22. (withdrawn) The method according to Claim 17, wherein the micro-beads in step (b) are activated with a coupling agent for the biomolecules

immobilized thereon.

Claim 23. (withdrawn) The method according to Claim 22, wherein the coupling agent is 1-ethyl-3-(3-dimethylaminopropyl)-carbodiimide hydrochloride.

Claim 24. (currently amended/withdrawn) The method according to Claim 17, wherein the vibrating means comprise a vibrating module that is set under the substrate.

Claim 25. (currently amended/withdrawn) The method according to Claim 24 ~~47~~, wherein the vibrating module comprises an electro-static vibrator.

Claim 26. (withdrawn) The method according to Claim 17, wherein the temperature of the substrate is controlled by a temperature control module for controlling the temperature of the reaction solution in the micro-wells.

Claim 27. (withdrawn) The method according to Claim 26, wherein the temperature control module comprises a temperature sensor, a heater, and a cooler.

Claim 28. (withdrawn) The method according to Claim 17, wherein the temperature sensor and the heater are a heating/sensing resistor.

Claim 29. (withdrawn) The method according to Claim 17 further comprising activating the reaction solution with a laser source.

Claim 30. (withdrawn) The method according to Claim 29 further comprising adjusting the laser source with a lens.

Claim 31. (withdrawn) The method according to Claim 17 further comprising applying a cover plate during the bioreaction.

Claim 32. (withdrawn) The method according to Claim 17 further comprising monitoring the bioreaction with a signal sensor.

Claim 33 (new). The micro-assay system according to claim 1, wherein the substrate is biologically inert to the biomolecules.

Claim 34 (new). The micro-assay system according to claim 1, wherein the magnetic force means is a magnet.